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July 1960

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AN ILLUSTRATED MONTHLY JOURNAL

Edited by

P. A. D. Hollom E. M. Nicholson

I. J. Ferguson-Lees Stanley Cramp

Photographic Editor: Eric Hosking

Hon. Editors: W. B. Alexander N. F. Ticehurst

Editorial Address: 30 St. Leonard's Avenue, Bedford

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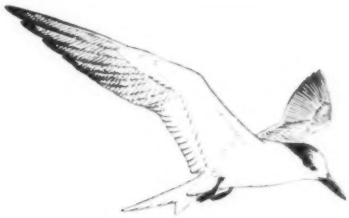

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British Birds

VOL. 53 NO. 7
JULY 1960

Kestrel pellets at a winter roost

By T. A. W. Davis

DURING THE WINTER of 1958-59 I collected 113 pellets of Kestrels (*Falco tinnunculus*) beneath roosts in a disused quarry near the Dale estuary, Pembrokeshire. The quarry is on a steep bracken-covered hillside surrounded by farmland and the saltings and lagoons of the estuary. Buzzards (*Buteo buteo*) have also roosted in it from time to time, and both they and Kestrels frequently hunt over the hillside. One Kestrel roosted irregularly in the quarry from about mid-November 1958 and by 3rd February 1959 a second roost was sometimes occupied. From the middle of the latter month both were used regularly until the end of March and then early in April roosting ceased there altogether. Neither Kestrels nor Buzzards roosted in the quarry during the following winter (1959-60).

In 1958-59 I visited the quarry at irregular intervals throughout the winter—twice in November and not less than three times in other months. On several occasions in December and January no pellets were found and for two periods of ten days the roost was probably not occupied.

I measured 73 undamaged pellets. The lengths varied from 12 mm. to 45 mm. and the widths (the averages of two diameters at right angles) ranged from 9 mm. to 16.5 mm. The average was 31.4×11.3 mm., which should be compared with the 33×14 given by Uttendörfer (1939) and Ellis (1946). Eleven (15%) of the pellets I found were less than Ellis's minimum length of 20 mm. (though only three of the eleven were under 18 mm.). Small pellets were usually without the characteristic taper of the larger ones and were without a "tail".

Ellis examined a series of 206 Kestrel pellets taken at a roost in the West Riding of Yorkshire between July 1944 and March 1945. It was clear from his paper that the winter was mild, but he did not comment on the state of the populations of small mammals. In

TABLE I—CONTENTS OF PELLETS OF KESTRELS (*Falco tinnunculus*) PEMBROKESHIRE, 1958-59

	Field Vole (*M. agrestis*)	Bank Vole (*C. glareolus*)	Shrews (*Sorex*) spp.)	Fur not identified	Birds	Beetles	Much earth
November 30th (11 pellets)	2	—	—	8	—	11	—
December 31st (15 pellets)	2	2	2	6	2	15	2
January 30th (16 pellets)	3	—	2	8	3	10	1
February 14th (18 pellets)	2	3	1	7	3	6	1
March 29th (49 pellets)	12	4	1	27	7	21	31
April 16th (4 pellets)	1	—	—	2	—	2	1
November-April (113 pellets)	22	9	6	58	15	65	36
Percentage of pellets containing	19%	8%	5%	51%	13%	57%	32%

The dates in the first column are those of the last collection in each month. Thus the 49 pellets collected during March had accumulated since 14th February. In November one pellet consisted largely of vegetable fibre; in December one consisted of fibre and earth and another contained the feathers of a Blackbird (*Turdus merula*); and in March one contained the culmen of a Yellowhammer (*Emberiza citrinella*).

Pembrokeshire the 1958-59 winter was mild and the populations of mice and voles were low, but shrews were abundant. As the paragraphs which follow show, there is close agreement in several ways between the two series of pellets. In addition, we both found comparatively few in the period November-January (suggesting that the roosts were not used every night) and in each case in the last part of the winter the roost was occupied by two birds instead of only one.

In both studies the principal prey found was the Field Vole (*Microtus agrestis*) (see Table I). In Pembrokeshire this species constituted 60%, and in Yorkshire more than 80%, of the small mammals identified. Several factors help to explain the difference between the two percentages. I found more pellets without fur than Ellis did and more of those with fur did not contain the cheek teeth necessary for the identification of small rodents. As a result, I identified only 37 small mammals in 113 pellets against Ellis's 78 in 138 collected during the corresponding period. At the same time I found a relatively high proportion of other mammals (see Table I). Of other species, Ellis recorded Long-tailed Field Mice (*Apodemus sylvaticus*), Common

Shrews (*Sorex araneus*) and Water Shrews (*Neomys fodiens*). I found Bank Voles (*Clethrionomys glareolus*) and shrews; the latter probably included both Common and Pygmy Shrews (*S. minutus*), but I had only lower jaws which are not sufficient for differentiating between them.

During a cold spell Ellis noted a definite increase in the number of pellets containing bird remains, but apart from this we both found that birds were taken infrequently (see Table I). Feathers in the pellets Ellis examined were very thoroughly comminuted, whereas I found (as we both did in the case of fur) that the degree of comminution varied from scarcely any to powdery. I was able to identify a Blackbird (*Turdus merula*) from feathers and a Yellowhammer (*Emberiza citrinella*) by its culmen.

I found very small quantities of fish scales in six pellets during March and April, and on 29th March 1959 I saw a Kestrel hover over the edge of a tidal lagoon of the Dale estuary, though it did not stoop. A Kestrel has been seen to catch a fish (Batten 1959) and shells of marine crabs have been recorded in pellets (Richards 1947).

Both Ellis and I found some beetle chitin in most pellets—he in all autumn pellets; I in all to the end of December, in nearly all (in diminishing amounts) in January and in up to 40% or 50% thereafter (see Table I). The only chitin identified in either series was of dung beetles (*Geotrupes* sp.); in Pembrokeshire these were Dumble-dors (*G. stercorarius*). These beetles were so frequent that they may well be the food next in importance after Field Voles. Even in the summer pellets Ellis identified only *Geotrupes* among beetles. The only other insect remains identified were an earwig (Forficulidae) in Ellis's series and a larval head in mine.

Ellis noted vegetable matter only as the remains of the contents of birds' crops and he did not record earth in any pellets. While the beetle content was high I had few with any appreciable amount of earth, but when beetles were scarce these earthy pellets became frequent and a few consisted almost entirely of earth. Thus until 14th February only 7% contained much earth, whereas in the period 15th February-29th March 60% did (see Table I). The earth was sandy, as though the clay fraction had been eliminated. I also found a little vegetable matter in a few pellets, such as blades of dead grass, and Uttendörfer (1939) recorded similar waste material. One pellet consisted almost entirely of fibre (probably comminuted grass) and another, very firmly compacted, of about equal quantities of fibre and earth. Tightly-packed grass has been found in the stomach of an emaciated dead Kestrel (Jackson 1954), while in another case (Ash 1955) much grass was discovered with other food in the stomachs of two out of six Kestrels examined: it was believed that the grass had been eaten purposely, a conclusion supported by the presence of comminuted

fibre in pellets. I might add that at different times I have seen a number of Buzzard pellets consisting mainly of earth, and once several grass pellets among normal ones at the roost of a Tawny Owl (*Strix aluco*).

Uttendörfer (1952), from his own observations and analyses of long series of pellets in Bavaria and from the north European literature, concluded that Long-tailed Field Mice constitute 80% of the Kestrel's food and that House Mice (*Mus musculus*) and Field and Bank Voles are taken in small numbers, with shrews and Moles (*Talpa europaea*) only occasionally. The two series of pellets discussed in this paper show that in Britain the Field Vole may at least sometimes take the place of the Long-tailed Field Mouse as the principal prey and it should be noted that I did not find the latter species at all. In other respects there are no important differences. Birds were taken in both Pembrokeshire and Yorkshire on a scale which agrees with Uttendörfer's findings. Lizards were not noted by either Ellis or myself, but an odd one occurred in several of Uttendörfer's (1939) analyses and he also frequently recorded a greater variety of insects. These included grasshoppers, crickets, mole-crickets, weevils and cockchafer larvae, but *Geotrupes* beetles were still the commonest.

SUMMARY

(1) The analysis of 113 pellets of Kestrels (*Falco tinnunculus*) from a roost in Pembrokeshire showed Field Voles (*Microtus agrestis*) to be the commonest prey. Bank Voles (*Clethrionomys glareolus*) and shrews (*Sorex* spp.) were taken frequently, birds occasionally, and Dumble-dor Beetles (*Geotrupes stercorarius*) regularly in early winter.

(2) In late winter, when beetles became scarce, many pellets contained much earth.

(3) A comparable series of pellets from Yorkshire (Ellis 1946) showed an even greater dependence on Field Voles, but a general survey (Uttendörfer 1952) concluded that Long-tailed Field Mice (*Apodemus sylvaticus*) form 80% of the Kestrel's food.

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Bird of prey numbers on a Hampshire game-preserve during 1952-1959

By J. S. Ash

INTRODUCTION

IN THE EIGHT YEARS from 1952 to 1959 I made counts of all the hawks I saw during visits to an estate of approximately 4,000 acres in west Hampshire. The species involved were Buzzard (*Buteo buteo*), Sparrowhawk and Goshawk (*Accipiter nisus* and *gentilis*), Marsh, Hen and Montagu's Harriers (*Circus aeruginosus, cyaneus* and *pygargus*), and Hobby, Peregrine, Merlin and Kestrel (*Falco subbuteo, peregrinus, columbarius* and *tinnunculus*). Times were noted to the nearest five minutes for each of the 1,378 visits—a total of 5,027 hours and 25 minutes, and an average of 3.65 hours per day. Unfortunately, the duration of visits was not evenly distributed throughout the year (Table I), and in 1952 no records were kept in January and February or from May to July. Incidentally, there are about 4,760 hours of potential hawk observation in a calendar year, so that the total here represents a little more than one year's continuous observation.

TABLE I—MONTHLY DISTRIBUTION OF HAWK COUNTS ON A WEST HAMPSHIRE ESTATE, 1952-1959

Counts were made in every month during these years, except in 1952 when January, February, May, June and July were missed.

	Total days observation	Total hours observation	Average hours observation per day
January ..	139	482.17	3.47
February ..	135	397.17	2.94
March ..	128	402.25	3.14
April	117	421.33	3.60
May	134	532.50	3.97
June	101	366.58	3.63
July	71	231.50	3.26
August ..	65	219.33	3.37
September ..	132	621.83	4.71
October ..	94	376.92	4.01
November ..	119	375.42	3.15
December ..	143	600.42	4.20
Totals ..	1,378	5,027.42	3.65

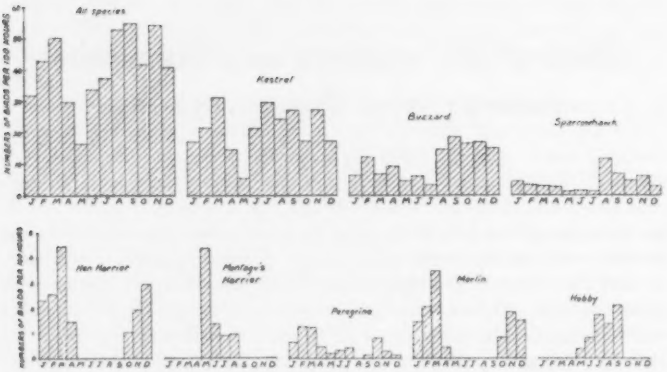

FIG. 1. Month-by-month counts per 100 hours of various species of hawks on a west Hampshire estate, 1952-1959: Buzzard (*Buteo buteo*), Sparrowhawk (*Accipiter nisus*), Hen and Montagu's Harriers (*Circus cyaneus* and *pygargus*), and Hobby, Peregrine, Merlin and Kestrel (*Falco subbuteo, peregrinus, columbarius* and *tinnunculus*). Note the difference in scale between the upper and lower rows of histograms.
The data from which this figure was drawn are shown on pages 288-289

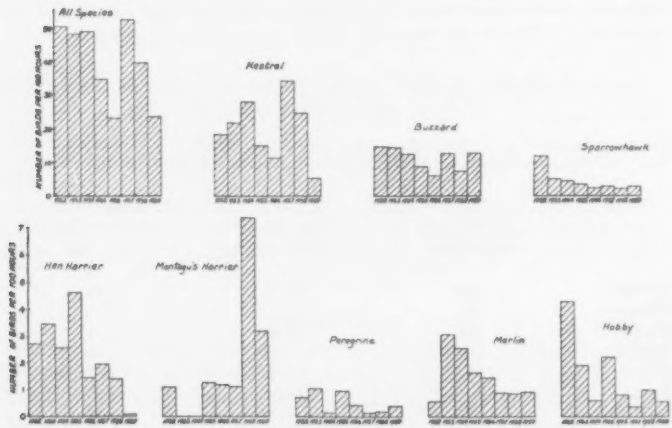

FIG. 2. Year-by-year counts per 100 hours of various species of hawks on a west Hampshire estate, 1952-1959: Buzzard (*Buteo buteo*), Sparrowhawk (*Accipiter nisus*), Hen and Montagu's Harriers (*Circus cyaneus* and *pygargus*), and Hobby, Peregrine, Merlin and Kestrel (*Falco subbuteo, peregrinus, columbarius* and *tinnunculus*). Note the difference in scale between the upper and lower rows of histograms. The data from which this figure was drawn are shown on pages 288-289

None of these visits was for the express purpose of observing hawks, except in four or five cases in May and June 1958 to watch breeding Montagu's Harriers. Otherwise, visits covered a multitude of other activities, not all equally favourable for hawk observation, including the intensive study of a population of Partridges (*Perdix perdix*)—which involved close observation from car or hide, census work from car or on foot, shooting days, nest searching, trapping, etc.—and a survey, mostly at weekends, of the breeding species of the open down and arable land.

Visits were made at all times of the day from dawn to dusk in each month, and on some occasions the time to begin or end observation had to be arbitrarily decided on, depending on the light and whether a hawk was likely to be seen after or before a certain hour. At all other times, observation periods were recorded only when the well-defined estate boundary was crossed. Besides the weeks when I was away from the district (part of March, August and October in most years), observation was restricted for short periods during two local outbreaks of foot-and-mouth disease, once in a spell of exceptionally wet weather when the water-logged ground was inaccessible to cars, and during a time of petrol rationing. Part of the records for one month was lost.

It may be thought that certain of the above activities would provide few opportunities to see birds of prey. It is actually extremely difficult to measure the relative likelihood of seeing them, for instance, when sitting in a closed car watching a covey of Partridges on the ground and when walking across open country on the alert for flying birds during census work. In fact, however, probably only half the total number of hawks were seen by direct observation and the remainder as a result of clues obtained from other species. Partridges are very alert to the presence of suspicious-looking birds and many hawks were noted only because of their reactions. In this respect it is worth mentioning their crouching and head-turning for a high-flying Peregrine that is perhaps just visible to the naked eye, or their headlong dash for a hedgerow on the distant approach of a harrier.

The duration of visits varied from eight hours down to half an hour. On the longer stays there was difficulty at times in deciding whether a bird had already been seen or whether it was a new individual. A deliberate effort was made not to count the same bird twice on the same day. This conservative policy undoubtedly led to underestimates, especially with the very large number of Kestrels in the autumn of 1957. On the other hand, while Kestrels are usually seen singly outside the breeding season, Buzzards frequently group together and so with them this error is less likely to occur. In addition, individual Buzzards and harriers especially are sometimes recognisable by a

DATA USE

Months and total hours observation		Buzzard		Sparrow-hawk		Goshawk		Marsh Harrier	
		Hawk nos.	100 hours	Hawk nos.	100 hours	Hawk nos.	100 hours	Hawk nos.	100 hou
January	482.17	30	6.22	22	4.56				
February	397.17	48	12.06	14	3.52				
March	402.25	27	6.71	12	2.98				
April	421.33	39	9.26	12	2.85			1	0.2
May	532.50	25	4.69	6	1.13				
June	366.58	22	6.00	6	1.64	[1]	0.27		
July	231.50	8	3.46	3	1.30				
August	219.33	32	14.59	26	11.85				
September	621.83	116	18.65	44	7.08	1	0.16		
October	376.92	63	16.71	18	4.78				
November	375.42	63	16.78	23	6.13			[1]	0.2
December	600.42	92	15.32	19	3.16			[1]	0.1

DATA USE

Species	1952			1953			1954			1955		
	No.	Hours	100 hours	No.	Hours	100 hours	No.	Hours	100 hours	No.	Hours	100 hou
Buzzard	41	276.83	14.81	114	772.33	14.76	88	691.83	12.72	69	748.25	9.2
Sparrowhawk	34	276.83	12.28	43	772.33	5.57	33	691.83	4.77	29	748.25	3.8
Goshawk		276.83		1	772.33	0.13		691.83			748.25	
Marsh Harrier		276.83			772.33			691.83		[1]	748.25	0.1
Hen Harrier	5	183.75	2.72	16	460.92	3.47	9	356.50	2.52	20	429.50	4.6
Montagu's Harrier	1	93.08	1.07		311.42			335.33		4	318.75	1.2
Hobby	4	93.08	4.30	6	311.42	1.93	2	335.33	0.60	7	318.75	2.2
Peregrine	2	276.83	0.72	8	772.33	1.04	1	691.83	0.14	7	748.25	0.9
Merlin	1	183.75	0.54	14	460.92	3.04	9	356.50	2.52	7	429.50	1.6
Kestrel	51	276.83	18.42	170	772.33	22.01	194	691.83	28.04	115	748.25	15.3
Totals	139	276.83	50.21	372	772.33	48.17	336	691.83	48.57	259	748.25	34.6

The data used in Figs. 1 and 2 on page 286 are shown above. The columns headed "100 hours" give the numbers of birds seen per hundred hours. In the lower set of data the total hours of observation vary from species to species because some are resident birds while others are confined to the winter or summer alone.

characteristic of plumage or moult. As residents, and prolonged visitors, are seen repeatedly from day to day, total counts do not represent individuals.

The type of country in this part of Hampshire is particularly attractive to hawks. Down one two-mile-long boundary of the present area lie 2,000 acres of mixed mature woodland in a single block. Buzzards breed in this, and although it is a game preserve a pair of Sparrowhawks

FIG. 1

Hen Harrier		Montagu's Harrier		Hobby		Peregrine		Merlin		Kestrel		Total	
Hawk nos.	100 hours	Hawk nos.	100 hours	Hawk nos.	100 hours	Hawk nos.	100 hours	Hawk nos.	100 hours	Hawk nos.	100 hours	Hawk nos.	100 hours
11	2.28					3	0.62	7	1.45	81	16.80	154	31.94
10	2.52					5	1.26	8	2.01	86	21.65	171	43.05
18	4.47					5	1.24	14	3.48	126	31.32	202	50.22
6	1.42					2	0.47	2	0.47	61	14.48	125	29.19
		23	4.32	2	0.38	1	0.19			31	5.82	88	16.53
		3	1.36	3	0.82	1	0.27			79	21.55	117	31.92
		2	0.86	4	1.73	1	0.43			69	29.81	87	37.58
		2	0.91	3	1.37					53	24.16	116	52.89
				13	2.09	1	0.16			169	27.18	344	55.32
4	1.06					3	0.80	3	0.80	67	17.78	158	41.92
7	1.86					1	0.27	7	1.86	103	27.44	205	54.61
17	2.83					1	0.17	9	1.50	106	17.65	243	40.80

N FIG. 2

1956			1957			1958			1959			Counts used in calculations
o.	Hours	100 hours	No.	Hours	100 hours	No.	Hours	100 hours	No.	Hours	100 hours	
5	727.75	6.18	95	730.50	13.00	44	561.08	7.84	69	518.83	13.30	All months
8	727.75	2.47	22	730.50	3.01	12	561.08	2.14	14	518.83	2.70	All months
	727.75			730.50		[1]	561.08	0.18		518.83		All months
1]	727.75	0.14		730.50		1	561.08	0.18		518.83		All months
8	553.50	1.45	9	457.75	1.97	5	359.42	1.39	1	331.92	0.30	Jan-Apr, Oct-Dec
3	251.83	1.19	3	272.75	1.10	15	201.67	7.44	6	186.92	3.21	May-Sept
2	251.83	0.79	1	272.75	0.37	2	201.67	0.99	1	186.92	0.53	May-Sept
3	727.75	0.41	1	730.50	0.14	1	561.08	0.18	2	518.83	0.39	All months
8	553.50	1.45	4	457.75	0.87	3	359.42	0.83	3	331.92	0.90	Jan-Apr, Oct-Dec
4	727.75	11.54	250	730.50	34.22	139	561.08	24.77	28	518.83	5.40	All months
2	727.75	23.63	585	730.50	52.70	223	561.08	39.74	124	518.83	23.90	All months

occasionally rears a brood there. The rest of the area, once open rolling downland, is now mostly under cultivation. Many hedgerows, some with trees, small copses and belts, a few young plantations, and one mature conifer planting, all help to provide cover and look-out posts for hunting or breeding hawks. As a game preserve the area holds a high population of Partridges and Pheasants (*Phasianus colchicus*), which must act as an attraction to predators. Also, because predators are maintained at a low level, the breeding success of small Passerines must be greater and their progeny must be attractive to birds of prey. In the summer this patchwork distribution of a variety of habitats attracts a very big population of breeding birds, and in the winter the

crops and open grassland are used by extremely large numbers of winter visitors and residents—especially Woodpigeons (*Columba palumbus*), Lapwings (*Vanellus vanellus*), Starlings (*Sturnus vulgaris*), Skylarks (*Alauda arvensis*), finches and Turdidae (all favoured prey species).

To the north and west there are very extensive tracts of similar country, mostly keepered. To the east and south there are almost equally extensive tracts of heathland and the New Forest, mostly unkeepered.

There have been very few unidentified hawks, and except for three "probables", these have been ignored in this discussion. Two Marsh Harriers and a Goshawk are included because there was merely a shadow of doubt about their identification. The other doubtful cases would not amount to one per cent of the total hawks observed.

In order to make comparisons from month to month and year to year, many counts have been converted to the number of hawks per 100 hours, irrespective of the number of hours of observation. Some of the main points which have emerged from these counts are discussed below under species headings, with the data summarised in Figs. 1 and 2 as a basis. Other relevant points of interest are introduced where necessary.

BUZZARD

The Buzzard was the second most numerous species (one per 8.90 hours of observation), being slightly more than half as numerous as Kestrels. The trend shown in Fig. 1 is for larger numbers in the last 4-5 months of the year, smaller numbers in the first four, and the lowest in the breeding season during May-July. This general trend held good for the first three complete years 1953-1956 (see Fig. 2), but after that there were very odd fluctuations; these were not always explicable, but were probably linked with the effect of myxomatosis on the staple food supply and with high populations of small mammals, the secondary food.

Myxomatosis first appeared in the local Rabbits (*Oryctolagus cuniculus*) in August 1954 and had decimated them by the end of that year, but this had no immediate effect on the Buzzards. Throughout 1955 Rabbits were almost totally absent, and although Buzzard numbers were low the usual autumn increase occurred. Rabbits were recovering in 1956 and there were some pockets where they were numerous. In spite of this, Buzzard numbers were very low throughout the year and there was no autumn increase—almost certainly a result of the extremely poor breeding seasons which followed the spread of myxomatosis (Moore 1957). This very low trend continued into July 1957, but was then followed by an increase in the autumn,

presumably due to an influx of young birds after a reasonably successful breeding season. This area was undoubtedly a very attractive one for Buzzards and Kestrels (*q.v.*) during this autumn, owing to the very high populations of small mammals. From 1956 there were always pockets of Rabbits building up to fairly high densities somewhere on the estate, and there was no repetition of the overall massive reduction in numbers caused by the first epidemic of myxomatosis.

In 1958 Buzzard numbers were unaccountably low and there was no autumn increase. This decrease continued into July 1959 to a level as low as any encountered so far, but was immediately followed by an increase in August/October far in excess of any previous numbers. These birds coincided with a localised outbreak of myxomatosis in a large Rabbit population. As gorged Buzzards were many times disturbed from Rabbits at this time, it can be assumed that they were providing an attractive focal point for the birds of a wide area. There were times when up to 8 or 9 Buzzards were seen in the air at once.

I had the impression that after the advent of myxomatosis Buzzards were seen soaring far less often. Although there are no figures to demonstrate this, it may be connected with a change in diet; it seems possible that they are compelled to spend longer in searching for smaller items of food and so have less time for "leisure".

As the area under survey was within a broad tract of country where game preservation was practised, Buzzards were frequently looked upon with suspicion—to put it mildly. In fact, however, throughout the period there were only three or four proven cases of a Buzzard killing a Pheasant or Partridge and in each instance the game-bird had been caught against a wire-netting fence. The fact that there were at least three records of Buzzards attacking decoy pigeons suggests that they are capable of attacking game in the open, but their attempts are probably too clumsy to meet with much success.

Another point of doubtful significance may be worth mentioning if peak autumn numbers of Buzzards can be used as a measure of breeding success. Peaks occurred in 1957 and 1959, which were also the best game years in the period under review. Large populations of Rabbits and/or other small mammals attract large numbers of Buzzards and must act as a buffer against predation on game birds—not only with Buzzards, but also with Cats (*Felis catus*), Foxes (*Vulpes vulpes*), Stoats (*Mustela erminea*) and Weasels (*M. nivalis*) which are the four most serious game predators.

SPARROWHAWK

The figures for the Sparrowhawk show clear-cut trends. In Fig. 1 it can be seen that there is a slow decline during the winter, followed by a low summer population. The immigration of juveniles that have

become independent of their parents forms the major increase in the counts in August. The fall is considerable in September, and thereafter the trend is mainly gradually downwards. Winter numbers are increased on a small scale by immigrants from the Continent, and proof of this was found in 1952 with the recovery in this area of a Sparrowhawk that had been ringed as a nestling in Norway earlier in the same year (Leach 1956).

The Sparrowhawk has always been the principal bird of prey affecting the game preserver and at the present time is the only species unprotected by law. Its numbers must be largely controlled by the effects of game preservation. During the war years persecution was greatly reduced and the population rose to an unusually high level. In 1952 numbers were still high (Fig. 2), but were reduced by more than half by the following year. Thereafter the trend was generally and gradually downwards.

Ringing results have shown (Thompson 1958) that British-bred Sparrowhawks are relatively sedentary and that movement is mostly confined to local juvenile dispersal. It is thus possible for a population to be controlled and considerably reduced. This has no doubt occurred in the present area where the total killed each year is now well below that obtained soon after the war (Table II).

TABLE II—ANNUAL TOTALS OF SPARROWHAWKS (*Accipiter nisus*) KILLED IN THE OBSERVATION AREA, HAMPSHIRE, 1949-1959

1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
45+	48	51	64	58	14	15	7	12	12	18

In 1952, 12 Sparrowhawks were seen per 100 hours, but an average of the four years 1956-1959 shows that by then only 2.6 were seen per 100 hours. Over the whole period a Sparrowhawk was seen on average once every 24.5 hours (i.e. Kestrels were five times more numerous, and Buzzards nearly three times more numerous).

This reduction in numbers is confirmed by the records of Portland Bird Observatory on the Dorset coast. Except for the very occasional bird, records of this species are confined to September and October and most are presumably migrants. They certainly do not breed on the Island. In the period 1952-1955 28 Sparrowhawks were seen in a total of 170 days of observation in September and October (one hawk per 6.1 days); whereas in 1956-1959 only 13 were seen on 235 days of observation (one hawk per 18.1 days).

Sparrowhawks are, of course, probably much more numerous than the numbers recorded would suggest. Their habit of hunting low and flying close to the cover of hedgerows means they are not so

readily seen. To illustrate this point, it is known that on one small area of 200 acres on the estate, where a concentrated study of Partridges was taking place, the gamekeeper trapped 10 Sparrowhawks during 4th March-29th April 1953; but in this same period, in 106½ hours of observation, only four were seen. This species is very easily trapped or shot, for it readily returns to kills if disturbed. It quite often feeds on birds and small mammals found dead and there are several instances of two or three Sparrowhawks being trapped at the same kill. Female Sparrowhawks are quite capable of killing adult Partridges, usually by pursuing them in low flight as they head for cover. Partridges seem to be most vulnerable in February and March, when newly paired; there is then very little crop cover to hide them and many young pairs are in strange surroundings. This sort of predation causes reduction of the Partridge breeding population and so is more important than late summer and winter losses.

An attempt has been made to establish the sex of all Sparrowhawks seen in the field, but when these figures are compared with those obtained from an examination of shot or trapped birds (Table III) there is found to be quite a wide discrepancy.

TABLE III—SEX RATIOS OF SPARROWHAWKS (*Accipiter nisus*) SEEN AND HANDLED IN THE OBSERVATION AREA, HAMPSHIRE, 1952-1959

	♂♂ seen	♀♀ seen	Ratios	♂♂ handled	♀♀ handled	Ratios
January-March	6	42	1:7.0	6	13	1:2.2
April-June	9	15	1:1.7	5	7	1:1.4
July-September	17	56	1:3.3	7	9	1:1.3
October-December ..	15	45	1:3.0	3	14	1:4.7
Totals	47	158	1:3.4	21	43	1:2.0

This may indicate that male birds are seen less readily than females, or that the basis of size in the field is not always a good guide to the sex of the bird concerned. However, wing-lengths were taken of a number of the birds handled, which showed that the sample contained several females with measurements well below those given in *The Handbook* (♂♂ 190-205 mm., ♀♀ 230-240 mm.). One imagines therefore that the tendency would be to identify these small birds as males and thus increase the ratio in favour of females in the case of birds seen in the field. As a matter of interest these wing-lengths (in mm.) may be worth recording here (an "adult" is any bird older than first-winter):

Females: (*adult*) 221, 222, 223, 226, 227, 229, 231, 231, 233; (*1st winter*) 217, 222, 224, 228, 228, 229, 229, 229, 229, 230, 230, 230, 231, 232, 233, 236, 236, 236, 236, 236, 237, 239, 239, 241, 242.

Males: (*adult*) 188, 190, 190, 196, 196, 200; (*1st winter*) 192, 194, 195, 195, 197, 199, 200, 200, 204, 204, 204.

Both sets of ratios in Table III show a higher proportion of males in the summer months. They are then more active when the females are incubating and brooding.

GOSHAWK

An adult female Goshawk was seen on 8th September 1953. A bird observed on 11th June 1959 was probably also one.

MARSH HARRIER

There is only one definite record of a Marsh Harrier—a male flying north on 3rd April 1958. However, two other hawks not positively identified, on 28th December 1955 and 6th November 1956, were most probably this species.

HEN HARRIER

Rather surprisingly, Hen Harriers proved to be the raptor fourth most often seen—one for every 68.9 hours of observation. I was most impressed by their frequency in the early years of counting. These birds were then seen daily by gamekeepers from mid-October to mid-April over this area of cultivated downland and the wintering population must have been fairly high. Now, however, they are rare.

Fig. 1 indicates a gradual increase in numbers from October (earliest on 17th) to December, a fairly steady wintering population from then until February and a major increase in March, this presumably due to passage birds. Numbers fall off rapidly in April (last on 17th).

Peak numbers were reached in 1955 (Fig. 2), and the annual totals up to that time were consistently higher than in the years that followed (1956-1959). The reduction can be appreciated best if the two periods 1951-1954 and 1956-1959 are compared. In the first four years a Hen Harrier was seen for every 28.61 hours of observation, whereas in the latter period it was down to one every 74.03 hours. The recoveries of ringed birds bred in Scotland do not suggest any distant southerly movement, which intimates that these Hampshire birds are probably of Continental origin.

Recognisable males are considered to be rather unusual amongst wintering Hen Harriers in the south of England, so it is of interest to note how high the ratio here was in favour of males (31 males: 42 "ringtails"). One of my earliest introductions to this species in this area was when two males and a "ringtail" could be seen at the same time hunting over a wide area of farmland.

In this type of country, Skylarks probably form their principal prey, although Partridges are taken whenever the opportunity arises. No

other bird of prey causes greater alarm to Partridges and it is an impressive sight to see every covey on a favourite feeding ground hurtle for the nearest shelter on the approach of a harrier; once part of a covey sought haven beneath my car.

In March 1956 one "ringtail" was believed to have been responsible for the deaths of 3 Partridges and 1 Red-legged Partridge (*Alectoris rufa*) in one week in its favourite feeding area, and on 26th March it was seen feeding on another fresh Partridge kill. On 5th December 1952 a "ringtail" attacked a group of 3 hen Pheasants, but they managed to dodge aside each time it stooped. This harrier then turned its attention to a cock Pheasant which retaliated by flying up and striking out with its feet each time it was attacked. Other food noted included Leverets (*Lepus europaeus*) and dead birds (Woodpigeon, Pheasant).

MONTAGU'S HARRIER

Records of Montagu's Harrier are confined to the months from May (2nd) to August (19th). The first occurred 15 days after the latest date for a Hen Harrier and the last was seen two months before the first autumn date for that species (17th October) (see Fig. 1). In 1958 a pair attempted to breed, but the eggs were sucked by Carrion Crows (*Corvus corone*) and soon afterwards the female disappeared. This hen was attended by two cocks and the frequency with which they were seen largely accounts for the increase shown in Fig. 2. However, this species was more numerous in west Hampshire and east Dorset generally in that year and at least 7 pairs were located within a 20-minute car journey of my home. They nested in young plantations, cereal crops and reed-beds, and on heathland, so that a wide choice of breeding habitat is available to them. In 1959 Montagu's Harriers prospected the same part of the counting area, but did not nest. Outside these years, records are confined to casual visitations.

Although their food is very varied, items in this area include egg and adult of Nightjar (*Caprimulgus europaeus*), young Rabbits, Meadow Pipits (*Anthus pratensis*), Skylarks, lizards, etc. There is only one record involving a game-bird: on 5th August 1953 a female was found eating a four-weeks old Partridge chick.

HOBBY

The Hobby is a summer visitor, confined to the months from May (9th) to September (18th) (Fig. 1), with the largest number at the end of this period, when wandering juveniles are probably mainly involved. Considering that the present observation area adjoins the main breeding area of the Hobby in Britain, it is surprising how infrequently it is seen. During most of the breeding season it is a secretive and elusive species, and the area is not an attractive one for its feeding purposes.

The Hobbies prefer the heaths near-by for larger moths, and the river valleys for insects and Hirundines, and it is in these places that they may be seen much more often.

Fig. 2 again suggests a downward trend with minor fluctuations. Comparing the years 1952-1955 and 1956-1959, we find that in the former period one Hobby was seen in every 131.01 hours of observation, but that in the latter the species was less than a third as frequent (one in 423.03 hours). It is difficult to account for this reduction, for the Hobby is in no way harmful to game and, except for the occasional very rare accident, is not persecuted by the man with the gun. Egg-collectors are known still to be very active in this area, however, and the Hobby is a "popular" species with them, so it is conceivable that repeated nest losses may account for this fall in numbers. Another possibility is that the recent series of bad summers may have affected the availability of their food and so reduced brood success. Comparable factors may be responsible for similar reductions in other species, including Red-backed Shrikes (*Lanius cristatus collurio*) and Wrynecks (*Jynx torquilla*).

PEREGRINE

The Peregrine was seen in every month except August; most often in February, March and October (Fig. 1). It was the eighth most numerous species and on average one was seen for every 209.48 hours of observation. The higher numbers in spring and autumn may refer to passage birds, but winter visitors occur occasionally. Summer records presumably refer to non-breeding birds; the nearest breeding birds are 30 miles away on coastal cliffs.

Fig. 2 shows there have been fewer Peregrines in recent years, and this is best demonstrated when the two periods 1952-1955 and 1956-1959 are compared. In the earlier period one Peregrine was seen in every 138.29 hours of observation; more latterly the figure has been one in 363.60 hours of observation.

This species is probably often overlooked, due to its habit of "waiting-on" at a great height. Several have been spotted by searching the sky after Partridges have indicated the presence of a hawk, or when Lapwings or Starlings have flocked in alarm. However, there have been a great many more occasions on which these phenomena have been observed and no falcon found.

No bird of prey engenders more alarm in the gamekeeper than the Peregrine. Although Woodpigeons are probably the main prey species in this type of habitat, Partridges taken on or close to the ground obviously form an important part of their diet. A quite surprising number of kills can be found in a fairly restricted area where a semi-resident Peregrine is working. Actual kills are not often seen, so that it may be of interest to describe how a male Peregrine struck one

of a pair of Partridges on 18th March 1953. Probably the falcon had seen the Partridges earlier from high above, for it came in low in a long glide at no great speed and killed by alighting on its victim's back. The only time a Pheasant was involved was on 19th March 1956 when a female Peregrine was disturbed from a freshly killed hen.

MERLIN

The Merlin was the fifth most numerous species, one being seen for every 100.5 hours of observation. None was seen from May to September in any year (Fig. 1). The first birds arrive in October followed by a two-fold increase in November, then wintering numbers are rather lower until spring passage begins in February. This reaches a peak in March, with only a trickle in April. As in the case of the Sparrowhawk, numbers seemed steadily to decline (Fig. 2) throughout the seasons in which complete counts were made. In 1953 an average of 3.04 Merlins was seen for every 100 hours of observation; this figure was down to 0.87, 0.83 and 0.90 in the three years 1957-1959, all on the basis of counts in October-April inclusive.

Records from Portland Bird Observatory support this impression of a reduction in Merlin numbers. There the main passage is from the last week of September to the first week of November, with only very few outside this period. When the figures for 1952-1955 (108 Merlins on 182 days of observation, average one per 1.7 days) are compared with those for 1956-1959 (63 on 308 days, average one per 4.9 days), it is seen that only about one third of the previous numbers have been recorded in later years. As, however, meteorological conditions are a factor to be taken into consideration when dealing with the migrations of this species, too much importance should not be attached to these comparisons.

On the basis of size, an attempt to sex the individuals concerned gave 17 ♂♂ and 21 ♀♀; the remainder could not be determined.

Their food appears to consist entirely of small birds taken in flight, and I have never seen one attempt to kill anything on the ground. Their usual method of hunting Skylarks is to fly low across a field where these birds are feeding, making a series of low stoops when the squatting birds are found. When it has flushed them the falcon then attempts to make a catch. Merlins frequently indulge in "playful" moods and carry out vigorous mock-attacks on other, usually larger, species. They will do this to a covey of Partridges on the ground and on one occasion, on 26th March 1954, after an unsuccessful attack at a flock of Chaffinches (*Fringilla coelebs*), a Merlin repeatedly stooped on a pair in the middle of a large field. Each time the falcon swept over their heads the Partridges "squawked" in alarm, but they did not fly off until the attack was over.

KESTREL

The Kestrel was the commonest species (one per 4.88 hours of observation) and slightly more numerous than all the others combined (one per 5.14 hours). Fig. 1 illustrates the beginning of the rise in the level of the winter population in February, as the return spring passage begins. Numbers reach a peak for the year in March, to fall rapidly in April, and even lower in May when the small local breeding population is established. They increase rapidly again in June and July as broods of young are fledged and wandering juveniles begin to appear. They then fall slightly in August, when autumn migration begins, and reach a secondary peak in September. Thereafter we might expect the figures to decline rapidly to a steady winter level, but in fact the histogram shows there is another secondary peak in November. When the annual totals for the eight years are compared, it is found that there were significant reductions in four Octobers (1952, 1953, 1957, 1958), and significent increases in five Novembers (1952-1954, 1957, 1958). Thus, in four years a reduction in October was followed by an increase in November (1952, 1953, 1957 and 1958). Probably local fluctuations in small mammal populations were responsible for these changes, but no figures are available, except that it is known that their numbers were extremely high in the autumn of 1957. In that year Kestrel numbers were well down by the end of December, but in the following March large numbers again occurred, presumably on return passage. It is reasonable to presume that high populations of small mammals cause local concentrations of their predators (see under BUZZARD for this period).

If the figures are viewed on an annual basis (Fig. 2), it will be seen that there is no obvious trend. There was a gradual increase to 1954, followed by a decrease to 1956, then a threefold increase in the following year. This peak was followed by rather smaller numbers in 1958 and an extreme low in 1959. But these figures bear little relationship to those of the breeding season (Table IV).

TABLE IV—YEARLY NUMBERS OF KESTRELS (*Falco tinnunculus*) PER 100 HOURS DURING APRIL-JUNE, 1953-1959

1953	1954	1955	1956	1957	1958	1959
47	76	50	15	19	59	16

These summer figures indicate three good years in 1953-1955, followed by a drop to populations of only about one-third in 1956, 1957 and 1959. 1958 proved the exception, but numbers then were high following the very large influx of the previous autumn. It would be interesting to know if these figures are indicative of a general downward trend.

Kestrels undoubtedly take some game-birds as food, although I have only two records of their killing wild Partridge chicks up to 3 weeks. The first time was on 27th June 1957 when a first-summer female was shot as it carried off a 3-week-old chick from a covey. The second was only four days later, on 1st July 1957. I was watching a pair of Partridges with eight fortnight-old chicks in a grass field, when a female Kestrel suddenly carried one off. The cock Partridge immediately flew up and struck the Kestrel from below. This knocked it off balance, but it managed to fly off successfully with the struggling chick.

Kestrels have been seen on a great many occasions hunting over areas where broods of Partridges have been feeding, without either species appearing to pay much attention to the other. On 30th June 1956 a Kestrel was watched hovering low over a pair of Red-legged Partridges that had a brood of young 2-3 weeks old. Each time the hawk stooped the adult partridges flew up and drove it off, until finally it abandoned the attempt. This suggests that game-birds are able to some extent to protect their broods from Kestrel predation. Under the open-field method of hand-rearing Pheasants, however, where the foster-mother hens are normally cooped, Kestrels can be extremely troublesome. Kestrels are quite capable of taking a bird up to the size of a Starling at least, right out in the open, and smaller birds are often killed. They frequently eat carrion and dead birds.

CONCLUSION

Of the ten species of birds of prey reported from this estate, the Kestrel has shown marked fluctuations in numbers, but there is no obvious trend. The Buzzard, too, has fluctuated, probably largely in relation to its food supply. The Sparrowhawk and Merlin have decreased greatly, probably chiefly due to game-preservation in the case of the former, but for unknown reasons in the case of the Merlin. The reduction in this particular population of Hen Harriers may be due to persecution by man in its winter quarters. The Peregrine has decreased, but it is unlikely that man has much effect upon this species away from its breeding quarters. The decrease of the Hobby is also difficult to account for, although the effects of egg-collecting may be partly responsible. The Montagu's Harrier is the only species which has increased noticeably, and in spite of persecution. This may be due to spread from breeding areas where it is relatively unmolested. The other two species, Marsh Harrier and Goshawk, were only vagrants. Altogether, one hawk was seen for an average of 2.51 hours of observation throughout the period.

It is not the object of this paper to discuss the pros and cons of these birds to man. However, as the counts were carried out in a game

preserve, a few words should be added from this point of view concerning their depredations in this particular area. The Kestrel is of no great importance, except on the open rearing field. Male Sparrowhawks will take game chicks, and females adult and young Partridges at all times of year; losses to this species could be important. The disturbance caused by Buzzards is considered to be exaggerated, and direct predation is insignificant. The Merlin and Hobby are both harmless to game. The Hen Harrier undoubtedly takes adult Pheasants and Partridges, but as this is mostly confined to the winter months it is of little importance. There is little evidence of predation on game by the Montagu's Harrier and it seems to prefer other species; but disturbance by it, especially of young broods, may be of some importance though this has not been observed. Game losses to the Peregrine are negligible on this estate, but in some areas this could be a significant species. Indeed, in other districts several of the above species may be more harmful. In particular, Buzzards appear to kill game-birds more often further west where they are more numerous.

ACKNOWLEDGEMENTS

I am very grateful to T. H. Blank who has made a number of counts for me in March and August in some years during my absence and has read the draft of this paper; to the Committee of the Portland Bird Observatory for the use of their records; and to I. J. Ferguson-Lees for his helpful suggestions in the presentation of this paper.

SUMMARY

(1) Over 2,000 birds of prey were counted in a total of over 5,000 hours' observation in the period 1952-1959 on a 4,000-acre game-preserve in Hampshire.

(2) The following species were recorded (in order of numerical superiority): Kestrel (*Falco tinnunculus*), Buzzard (*Buteo buteo*), Sparrowhawk (*Accipiter nisus*), Hen Harrier (*Circus cyaneus*), Merlin (*F. columbarius*), Montagu's Harrier (*C. pygargus*), Hobby (*F. subbuteo*), Peregrine (*F. peregrinus*), Marsh Harrier (*C. aeruginosus*) and Goshawk (*A. gentilis*).

(3) Sparrowhawks, Merlins, Hen Harriers, Peregrines and Hobbies decreased; Buzzards and Kestrels fluctuated in numbers; Montagu's Harriers increased. Marsh Harrier and Goshawk were vagrants.

(4) There are comments on habits, food, effect on game-birds and possible causes of change in status.

(5) An average of one hawk was seen for every 2½ hours of observation.

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THOMPSON, A. L. (1958): "The migrations of British hawks (Accipitridae) as shown by ringing results". *Brit. Birds*, 51: 85-93.

PLATE 37. Great Tit (*Parus major*) threatening Long-tailed Field Mouse (*Apodemus sylvaticus*) as it feeds; in this and the next three photographs note the mouse's apparent lack of concern at the presence of the birds (page 302) (*photo: M. S. Wood*)

PLATE 38. Above, Chaffinch (*Fringilla coelebs*) and, below, Robin (*Erithacus rubecula*) disputing for food with Long-tailed Field Mouse (*Apodemus sylvaticus*) (*photos: M. S. Wood*)

PLATE 39. Above, Blue Tit (*Parus caeruleus*) and Long-tailed Field Mouse (*Apodemus sylvaticus*); below, Blue Tit and Chaffinch (*Fringilla coelebs*) fighting (page 302) (*photos: M. S. Wood*)

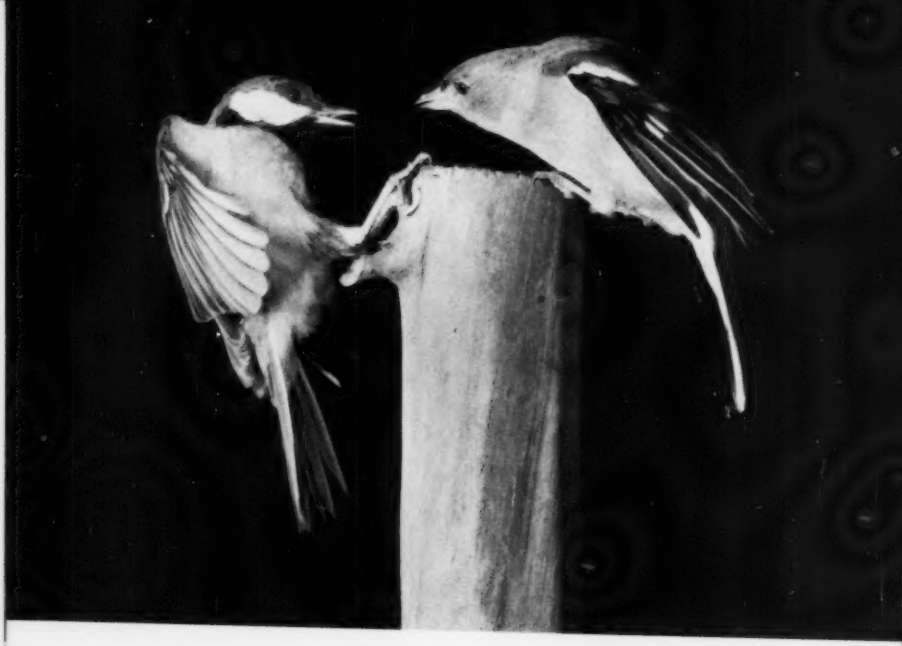


PLATE 40. Above, Chaffinch (*Fringilla coelebs*) posturing at Great Tit (*Parus major*) and, below, Dunnock (*Prunella modularis*) threatening Blue Tit (*P. caeruleus*) (*photos: M. S. Wood*)

PLATE 41. Robin (*Erithacus rubecula*) dropping down at Chaffinch (*Fringilla coelebs*) as it approaches the food-post; in all these photographs food had been placed in special hollows in the branches or posts (page 301) (*photo: M. S. Wood*)

PLATE 42. House Sparrow (*Passer domesticus*) landing momentarily on Blackbird (*Turdus merula*) at the food-post; the point of attack is, as usual, the head and the Blackbird has drawn the nictitating membrane across its eye to protect it (page 303)
(*photo: M. S. Wood*)

PLATE 43. Above, Great Spotted Woodpecker (*Dendrocopos major*) threatening Jay (*Garrulus glandarius*)—note the raised crest and extended wings (page 302)—and, below, Song Thrush (*Turdus philomelos*) in forward threat at Starling (*Sturnus vulgaris*) (*photos: M. S. Wood*)

PLATE 44. Cock Chaffinches (*Fringilla coelebs*) fighting at the food-post; this is the usual vertical flight attack, the two birds rising and falling together, clawing and pecking at one another (*photo: M. S. Wood*)

M. S. Wood's garden and bird-table photography

By Stuart Smith

(Plates 37-44)

THE LATE DR. MARTIN WOOD, who took the remarkable photographs of birds in aggressive attitudes shown in this issue, had been recognised as a first-class bird photographer of the conventional type for many years before circumstances forced him to less conventional methods. His family was well known in Lancashire cotton circles and there was a flourishing business career awaiting him, but he would have none of it. Instead he read medicine and became a specialist in psychiatry at a large mental hospital in Cheshire, where in pleasant surroundings he could indulge his twin passions of cricket and the study of natural history.

The death of his father left him with enough money to retire at a relatively early age, and he bought a house at Orrest Foot, overlooking Windermere. The garden was quickly converted into a sanctuary for wild life and he spared no pains to make it attractive to birds and beasts. He disliked the usual type of bird table, and hollowed out logs and tree-trunks which he supported horizontally a few feet from the ground and stocked with food.

Two circumstances then led him to use his garden sanctuary more and more for his photographic studies. The first was that he became partially crippled by arthritis, which greatly limited his ability to get about the countryside, and the second was the marketing of an electronic flash apparatus which he immediately bought. He installed a camera and its attached high-speed flash apparatus permanently just inside the open French windows of his study, and there he would sit for hours content to wait for anything that might come along. In his hollowed logs he used a mixed bait of nuts, bread and meat offal, and thus attracted small mammals as well as various birds. The photographs that accompany this text are just a few of those he obtained by this method. They are of special interest because they were taken under perfectly natural conditions and did not involve the use of dummies or stuffed specimens, such as were employed by George Edwards, Eric Hosking and myself in our studies of the aggressive displays of certain birds (*Brit. Birds*, 42: 13-19; 43: 144-150). There can thus be no question of secondary reactions having occurred here—such as the displacement postures which we saw and recognised

when our dummies failed to respond to the displays and attacks of the birds.

The first four photographs (plates 37, 38 and 39a) are of a Great Tit (*Parus major*), a Chaffinch (*Fringilla coelebs*), a Robin (*Erithacus rubecula*) and a Blue Tit (*Parus caeruleus*) disputing over food with a Long-tailed Field Mouse (*Apodemus sylvaticus*). They are of considerable significance because they show how remarkably little reaction there was from the mouse to the flight-attacks of the birds. The mouse is holding food in its fore-paws and is apparently unconcerned by the presence of its aggressors: in this its behaviour is quite different from the attitudes of birds to the presence of rivals at food sources. The fact of the appearance of the mouse at the bait during the day-time also calls for comment, as this species is normally nocturnal and seldom seen by day unless ill or started from its burrow by some predator. Lack of disturbance and a constant food supply have, however, overcome its fear of the light and thus it has come, somewhat artificially perhaps, to be a competitor with the birds for the food. The known ability of the Long-tailed Field Mouse to climb to considerable heights accounts for its presence on a vertical post. It is unfortunate that we have no record of the final outcome of the threats and attacks of the birds against the mouse, but judging from the photographs it seems unlikely that they were very effective in moving it.

Inter-specific competition and the corresponding threat, and in some instances fighting, attitudes are illustrated in most of the rest of the photographs. The next two show once again a Blue Tit and a Great Tit in action, but this time against a Chaffinch. Chaffinches are aggressive birds and tough fighters as Hosking and I found when experimenting with a stuffed Cuckoo (*Cuculus canorus*), but so are Blue Tits and in plate 39b the tit is shooting out a foot with claws extended to ward off the Chaffinch. In plate 40a a Great Tit has just landed on a post already occupied by a Chaffinch, and the latter counters with a forward threat posture. Plate 41 shows a Robin in a remarkable attitude in mid-air, likewise demonstrating against a Chaffinch. Chaffinches also fight vigorously amongst themselves and plate 44 illustrates the usual vertical flight attack—in which two birds rise and fall together in the air, clawing and pecking.

Unusual pairings, as far as competition is concerned, are shown in plates 40b and 43a with Dunnock (*Prunella modularis*) and Blue Tit, and Jay (*Garrulus glandarius*) and Great Spotted Woodpecker (*Dendrocopos major*). Dunnocks are thought by many to be unobtrusive, timid birds, but they can be very aggressive during the breeding season, as I know from personal observation, and this one is evidently not yielding to the Blue Tit. The posture of the Great Spotted Woodpecker against the Jay is typical of that shown by this species in sexual and

aggressive displays. The wings are widely extended and quiver, the crown feathers are raised and the tail is spread, full use thus being made of feather patterning and coloration.

More usual, from a competitive point of view, are the encounters between Starling (*Sturnus vulgaris*) and Song Thrush (*Turdus philomelos*) (plate 43b) and between Blackbird (*T. merula*) and House Sparrow (*Passer domesticus*) (plate 42). The forward posture with widely gaping beak used by the Song Thrush is typical of this form of threat display in the genus *Turdus* and should be compared with Hosking's photograph of a Mistle Thrush (*T. viscivorus*) in threat attitude (*Brit. Birds*, 43: plate 14, figs. 9 and 10). The attack by the House Sparrow on the Blackbird shows features that are common to many such cases where the aggressor alights momentarily on the other. The point of attack is usually the head and nape, as we frequently observed when using stuffed birds. It should be noted that the Blackbird has immediately drawn the nictitating membrane across its eye to protect it, and it is probable that the other eye is similarly covered.

These photographs are just a few selected from many taken by Martin Wood, to show the kind of result that can be obtained in a garden, if long preparation and great patience are used.

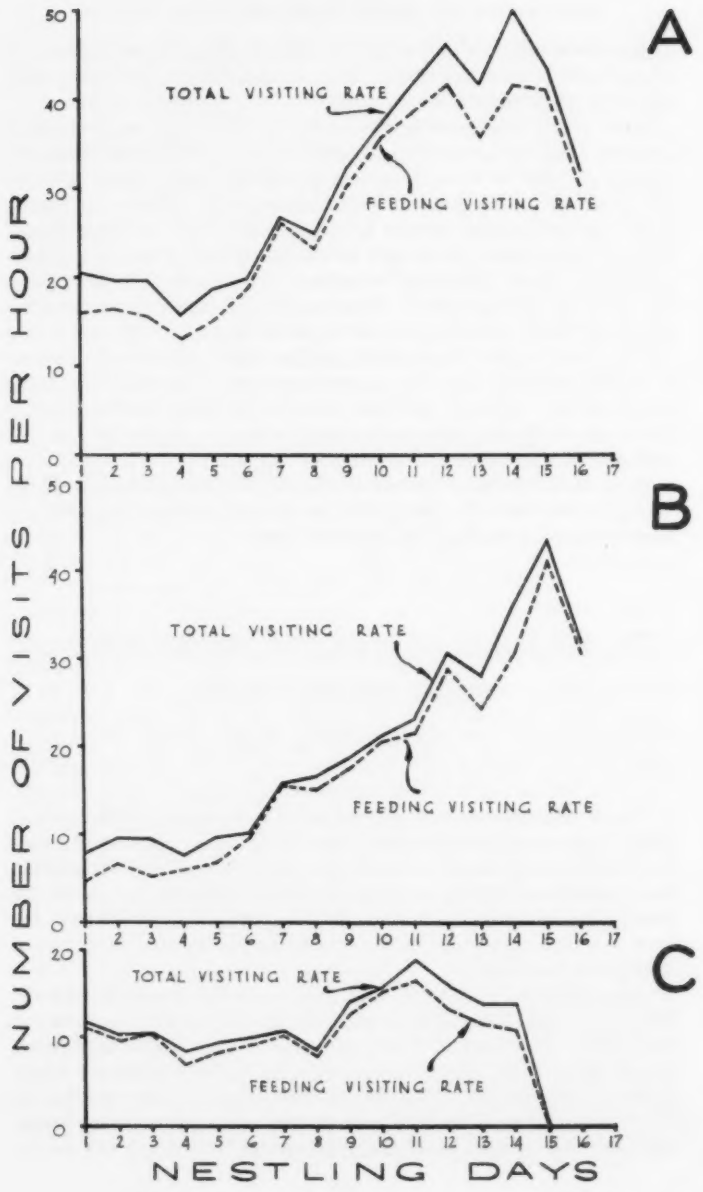
The behaviour of a pair of House Sparrows while rearing young

By David C. Seel

INTRODUCTION

In 1959 observations were made on the behaviour of a pair of House Sparrows (*Passer domesticus*) rearing their second brood of young in an observation nest-box in the suburban district of Pinner, Middlesex. Fixed near the eaves of a house and eighteen feet above the ground, the box was outside the top of an open window. Watch was kept at a distance of eighteen inches from the interior of the room which was darkened.

Three of the four eggs in the nest (No. 132 in the observer's records) hatched on 29th June before 1030 hours GMT, and the fourth on the 30th before 0600 hours. One young was missing before 0558 hours on 2nd July. The other three young were in the nest for the whole of the nestling period. The first of these three left on 14th July at 0929 hours, and the second the same day between 1545 and 1625 hours. The third left on 15th July before 0545 hours.


A
B
C
TOTAL VISITING RATE
FEEDING VISITING RATE
NUMBER OF VISITS PER HOUR
NESTLING DAYS
0
10
20
30
40
50
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

During the nestling period a six-hour observation watch was maintained daily, on the first day from 1200 to 1800 hours GMT and thereafter usually from 0600 to 1200 hours. Additional watches were kept to obtain an indication of awakening and roosting times. Except for these awakening and roosting times, however, the results presented for this nest are drawn solely from the six-hour periods. For comparison, some results from another nest (No. 82) are included.

Evidence strongly suggested that the female of the pair was drowned in a water-butt during the afternoon of the fourteenth day and that the subsequent behaviour of the male was abnormal (abnormal for a pair, but perhaps normal for a male whose mate has died).

THE SHARES OF THE SEXES IN FEEDING THE YOUNG

At most times it was difficult to identify the food brought by the adults to the young and nearly always impossible to assess the quantity. Observations suggested, however, that both adults brought about the same quantity and that the amounts were small during the early days, larger in the middle part of the period and small again on the last two days.

Owing to these difficulties, the assessment of the shares of the sexes in feeding the young has been based upon the number of feeding visits made by each. During the first six days the proportion of feeding visits by the male averaged 41%, during the seventh to fourteenth days inclusive 64%, and on the last two days 100%.

THE RATE OF FEEDING THE YOUNG

Feeding rates were thus assessed from the numbers of feeding visits made by the adults. These results are presented in Fig. 1. The fall in the combined feeding rate of male and female on the fourth day may have been related to the reduction in the number of young from four to three. Thereafter the combined feeding rate generally increased to a maximum on the fourteenth day and then declined, owing in part to the female's complete cessation of feeding. The feeding rate and the length of time the young were brooded were related to the extent that, as the former increased, so the latter declined. On the eighth and thirteenth days, when there were marked increases in the duration of brooding periods compared with those of the previous days (Fig. 3), the feeding rate fell.

FIG. 1. Total and feeding visits per hour by a pair of House Sparrows (*Passer domesticus*) to their second brood, Middlesex, June-July 1959 (Nest 132). A shows the visiting rates of male and female combined, while in B and C respectively they are separated (page 306 and *cf.* Fig. 2); the female is believed to have been drowned on the fourteenth day

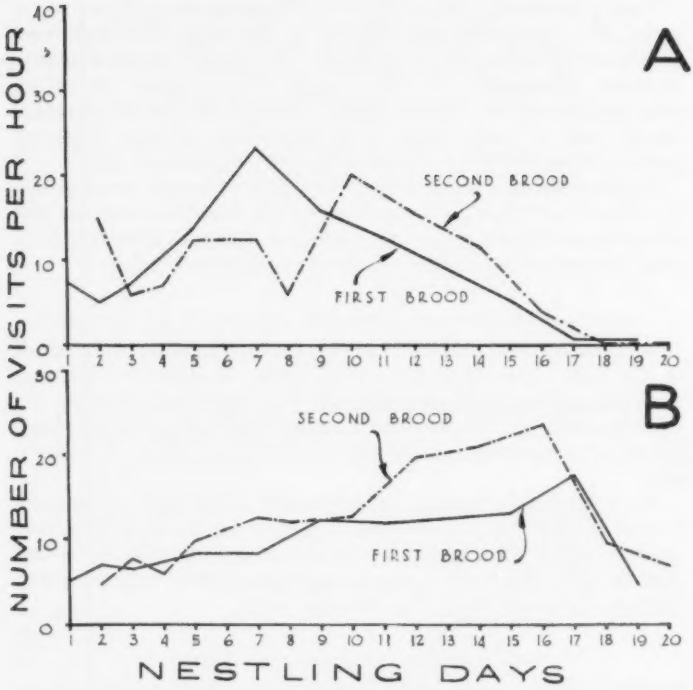


FIG. 2. Numbers of visits per hour by a pair of House Sparrows (*Passer domesticus*) to their first and second broods, Middlesex, May and June-July 1957 (Nest 82). A shows the visiting rates of the male and B those of the female. This nest was watched for only a minimum of two hours in the morning, but the data provide a useful comparison with the total rates in Fig. 1

The individual feeding rates of male and female differed considerably (Figs. 1b and 1c). The pattern of the feeding rate of the male, who took the major part, was similar to the combined feeding rate. The male's maximum occurred on the fifteenth day. On the sixteenth day he averaged 34 feeding visits per hour (during 3½ hours) before the first young left the nest; after which his rate fell to 20 per hour (during 2½ hours)—approximately one-third less.

The feeding rate of the female changed less than that of the male. Her rate was low and about the same for the first eight days. Then there was a rise to a maximum (less than half the maximum of the male) on the eleventh day. A decline followed. The female was not seen to visit the nest after the fourteenth morning.

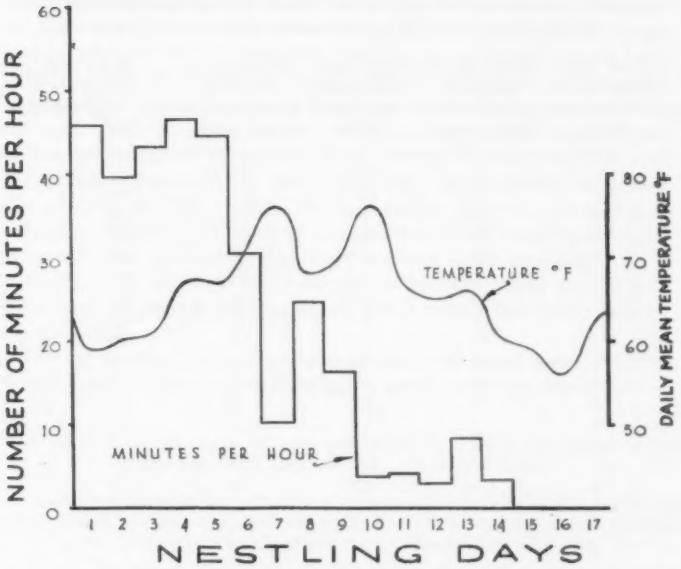


FIG. 3. Numbers of minutes per hour spent by a pair of House Sparrows (*Passer domesticus*) in brooding the young of their second brood, Middlesex, June-July 1959 (Nest 132). (The values shown are slightly too large since they are actually the periods spent at the nest and true brooding was interspersed with other activities.) Note the apparent influence of the temperature in the middle of the nestling period when the brooding urge was waning, and also the relationship between the brooding rates and the feeding rates shown in Fig. 1

The young were not fed at every visit by the adults to the nest, though it can be seen from Fig. 1 that the pattern of the feeding rate closely approximated to that of the total visiting rate. The total visiting rate is given for comparison with the total rates obtained by watching for a minimum of two hours in the morning the first and second broods in the 1957 nest (No. 82) already mentioned (Fig. 2).

BROODING OF THE YOUNG

It was not possible to assess precisely the time the adults spent brooding because the periods, usually short, were irregularly interspersed with other activities, such as probing in the nest. For this reason "brooding" has been shown (Fig. 3) as the lengths of the visits during which actual brooding occurred. Obviously the values obtained by this method are slightly too large, but they show the pattern. Both adults brooded the young, doing so in the first five days for an average

TABLE I—TIME SPENT BY A PAIR OF HOUSE SPARROWS (*Passer domesticus*) IN BROODING THE YOUNG, MIDDLESEX, JUNE-JULY 1959

Nestling day	Total hours observation before 0800 GMT	Percentage of this time spent brooding (both sexes)	Total hours observation after 0800 GMT	Percentage of this time spent brooding (both sexes)	Share of brooding during the six hours (percentage)	
					Male	Female
1	—	—	6.0	77	46	54
2	2.0	76	4.0	61	45	55
3	2.0	73	4.0	72	50	50
4	2.0	85	4.0	75	48	52
5	2.0	83	4.0	72	46	54
6	2.0	72	4.0	40	41	59
7	2.0	28	4.0	20	42	58
8	2.0	56	4.0	34	44	56
9	2.0	28	4.0	27	22	78
10	2.0	12	4.0	3	20	80
11	2.0	11	4.0	3	8	92
12	1.0	8	5.0	5	6	94
13	1.4	2	4.6	18	27	73
14	2.0	8	4.0	4	0	100
15	2.0	0	4.0	0	—	—
16	2.0	0	4.0	0	—	—
17	—	—	—	—	—	—

of 44 minutes per hour, from the sixth to the ninth day for an average of 21 minutes and from the tenth to the fourteenth day for an average of 5 minutes. Brooding was negligible on the fifteenth and sixteenth days. Fig. 3 suggests that brooding time in the middle of the nestling period was influenced by the temperature. With the exception of the thirteenth day there was more brooding in the early and cooler part of the morning (before 0800 hours) than later (Table I). The male's share of the brooding during the first eight days averaged 45%, and from the ninth to the fourteenth day 14%. His share decreased sharply between the eighth and ninth day.

NEST-SANITATION

On the first day the adults swallowed the faecal sacs. On the second day they both swallowed and carried them away, in the ratio 1:2. Thereafter, with very few exceptions, faecal sacs were carried away.

The young defecated approximately once every two hours. (This is the average of the six-hour periods for the whole of the nestling period; it appeared to be subject to daily variation.) Before defecating, the young raised their posterior regions away from the centre of the nest.

During the first seven days, they defecated on to the sides of the nest,

and were sometimes seen to do so towards the entrance hole. Throughout the nestling period one corner of the box just inside the hole was particularly used for this purpose. By the seventh day the adults were already sometimes feeding the young without completely entering the box and they began to remove faeces merely by leaning through the entrance. On the eighth day the young, having grown larger, began to defecate on to the entrance hole lip, as well as inside the box, and did so more frequently as time went on. These faeces were also carried away by the adults. On the twelfth day the young began defecating directly out through the entrance hole; and thenceforth defecated both inside and outside the box and at the entrance.

When in the nest both adults frequently probed among and beneath the young, sometimes finding objects which were either swallowed or carried away.

During the first eleven days the male was seen seven times, and the female once, to bring material (feathers, grass, fluff) into the nest.

TABLE II—TIMES OF AWAKENING AND ROOSTING OF A PAIR OF HOUSE SPARROWS (*Passer domesticus*), MIDDLESEX, JUNE-JULY 1959

Times are given in minutes before (−) or after (+) sunrise and sunset. The dashes mark the three nights (8th/9th, 9th/10th and 10th/11th) on which it is known that no bird roosted in the nest. A complete blank indicates that no observations were made.

	Morning departure of bird roosting in nest	First visit of bird not roosting in nest	Evening arrival of bird going to roost in nest	Last visit of bird not roosting in nest
June 29th				
30th				
July 1st			−26 (♀)	−29 (♂)
2nd	0 (♀)	−2 (♂)	−23 (♀)	−29 (♂)
3rd				
4th	−18 (♀)	−19 (♂)	+10 (♀)	+16 (♂)
5th			−1 (♀)	−34 (♂)
6th	before −30 (♀)			
7th				
8th			—	before −45 (♂) −36 (♀)
9th	—	−14 (♀) −4 (♂)	—	
10th	—	−1 (♀) +8 (♂)	—	−36 (♀) −35 (♂)
11th	—	+16 (♀) +29 (♂)		
12th			−11 (♂)	
13th	−16 (♂)		−13 (♂)	
14th				
15th				

ROOSTING OF THE ADULTS

The female roosted in the nest until at least the seventh night, but not after the ninth night. After her presumed death on the fourteenth afternoon, the male roosted in the nest during the fourteenth and fifteenth nights, but not during the sixteenth. On this last night he apparently went to roost, but was disturbed by a noise made by the observer, left the box and did not return again that evening.

From the data collected on awakening and roosting times (Table II) the following notes were made. When the female roosted in the nest she first left it at or before sunrise, but not before the male arrived. When the female roosted elsewhere, she first visited the nest about ten minutes before the male did. Twice she did so before sunrise, but on the thirteenth day a thunderstorm preceded sunrise and seemingly delayed the arrival of the adults. When the male roosted in the nest, he was once recorded as first leaving it before sunrise.

The female went to roost in the nest between 26 minutes before and 10 minutes after sunset. When roosting elsewhere, she made her last visits at 36 minutes before sunset. The male roosting away from the nest made his last visits at least 16 minutes before sunset. When spending the night in the nest, the male went to roost at 11 and 13 minutes before sunset.

SUMMARY

(1) In feeding the young the share of the male of a pair of House Sparrows (*Passer domesticus*) in Middlesex increased through the nestling period from the minor to the major part.

(2) The combined feeding rate of male and female reached its maximum on the fourteenth day. The pattern of the male's rate alone resembled that of the pair combined. The female's rate changed less markedly, and the maximum reached on the eleventh day was much smaller than the male's. The total visiting rate differed from that recorded at another nest.

(3) Both adults brooded the young to some extent during almost the whole of the nestling period; for the first five days they did so for about three-quarters of the time and subsequently less and less.

(4) All faecal sacs were swallowed by the adults on the first day and thereafter were mostly carried away. The young defecated about once every two hours. The adults removed faeces deposited in the nest-box. In the nest the adults probed in the bottom of the nest. Occasionally the male, and once the female, brought material to the nest.

(5) The female roosted in the nest for about the first half of the nestling period and after her presumed death the male did so at the end of it. In the morning the female first left the nest or first visited it usually before sunrise, while the male did so between 19 minutes before and 29 minutes after sunrise. The male and usually the female made their last visits before sunset.

ACKNOWLEDGEMENTS

The author wishes to thank Graham Phillips for much helpful advice and the Director-General of the Meteorological Office for permission to publish climatological information from the Wealdstone records.

Notes

Olivaceous Warbler in Co. Donegal.—At about 6 p.m. on 29th September 1959 I found a strange warbler among the small walled enclosures of the lighthouse grounds at the western end of Tory Island, Co. Donegal. The light was very poor and fading, so that binoculars were of limited value, but I was able to watch it for some ten minutes at often close range. My initial impression was that it was something like a Northern Willow Warbler (*Phylloscopus trochilus acredula*), though too brown, and indeed whenever it returned to a bush its distinctly *Phylloscopus*-like appearance caused me to think that I was making a stupid mistake. However, its silhouette revealed that it was a very different bird. It had a notably long bill and the high forehead of the *Hippolais*, and its carriage on the ground was rather pipit-like, with fairly long legs and a longish tail for a warbler, carried rather level. Its behaviour was something like that of an Icterine Warbler (*Hippolais icterina*), but without quite that bird's zest and excitability. It darted about a little in the manner of a flycatcher and had an odd habit of perching half way up walls on no very obvious ledge. It seemed to have no objection to the open ground and hopped about freely on the bare forecourt of the lighthouse. It frequently perched on the tops of walls and there it was noticeable that it had a wagtail-like habit of flicking its tail. The wings were not especially long.

As this was clearly a *Hippolais* which was unfamiliar to me—I had previously seen both Icterine Warbler and Melodious Warbler (*H. polyglotta*)—and as the light was fading so much that I was certain not to get any further information on colour, I set a mist-net and caught the bird. I was then able to identify it as an Olivaceous Warbler (*H. pallida*). The following laboratory inspection was carried out under gas and electric light:

> Upper-parts uniform dirty olive-brown; flight feathers and tail slightly darker, though the opposite effect was given in the closed wings by lighter edges to the primaries; slight light eye-stripe. Under-parts dirty grey, more olive at the sides of the breast; chin whiter. Legs horn colour with a bluish tinge (but none of the brightness of those of the Icterine). Bill fairly broad and distinctly long, with a heavy ridge effect along the top, the feathers growing down to the nostril on the side but not on the ridge; bill colour dark brown above, pinkish below and very light on the flanges; inside of mouth bright yellow with orange veins. Eye grey-brown with dark pupil. *Measurements:* wing 62 mm., tail 53 mm., tarsus 20 mm., bill 8.25 mm. from nostril and 15 mm. from skull with maximum width 5.5 mm.; two outermost tail-feathers 2 mm. and 6 mm. shorter than longest, and several others only half-grown. *Wing-formula:* 4th primary longest, 3rd and 5th equal and fractionally shorter, 6th −3.5 mm., 2nd −5, 7th −8, 8th −10, 9th −12, 1st 4.5 mm. longer than primary coverts. *Weight:* 9.15 gm.

The bird was then ringed and released. This is the first record of this species in Ireland. R. G. PETTITT

[Only two previous records of the Olivaceous Warbler in the British Isles are now accepted: one at Skokholm, Pembrokeshire, in September and October 1951 (*Brit. Birds*, 46: 191-192) and one at Portland, Dorset, in August 1956. Full details of the latter have not previously appeared in this journal and we take this opportunity of publishing them.—EDS.]

Olivaceous Warbler in Dorset.—An Olivaceous Warbler (*Hippolais pallida*) was caught in a funnel trap at Portland Bird Observatory, Dorset, shortly after noon on 16th August 1956. It was examined in the observatory then by the undersigned and also by Dr. J. S. Ash, E. G. Darton, K. V. Edwards, Dr. K. B. Rooke and G. E. C. Waterhouse. In general appearance it was a slender, medium-sized warbler with a remarkably broad and flattened bill and a tail that was almost square except for shorter outermost feathers; it had pale brown upper-parts with a faint whitish superciliary stripe extending just behind the eye, and dirty white under-parts. Its alarm note was a rather loud sparrow-like "chut" or "chek" repeated two to six times; it reminded W.R.P.B. of a very loud, abrupt Icterine Warbler's (*H. icterina*) call and he has since heard Olivaceous Warblers utter it in Cyprus, whilst KDS had heard the same note used singly by this species in Eritrea. The following is a summary of the laboratory description:

Upper-parts: crown, mantle and rump greyish-brown with a faint olive tinge; an indistinct pale creamy-buff supercilium (more noticeable at a distance); upper wing-coverts with brown centres and indistinct buff edges; primaries and secondaries with darker centres and distinct pale greyish-buff edges (most marked on inner secondaries); tail brown with narrow pale outer margins to outside feathers and almost square except that outer feathers were 3 mm. shorter. *Under-parts:* throat, sides of breast and flanks dirty whitish tinged yellowish-buff; belly and vent a very pale buffish-white; axillaries and underwing-coverts brownish-white; no trace of lemon yellow on the under-parts. *Soft parts:* bill dark horn with yellow on lower mandible; prominent orange-yellow gape; two stout rictal bristles; legs variously described as "lead grey", "bluey-grey" and "slate blue", appearing darker brownish-slate in poor light; iris dark brown. *Measurements:* wing 64 mm. (straightened), tail 47 mm., tarsus 20.5 mm., exposed culmen 10.25 mm., whole bill to skull 13.5 mm. and 5 mm. wide at the base; weight 11.2 gm. (at 1800 GMT). *Wing-formula:* 3rd and 4th primaries longest, 5th −1 mm., 2nd −5 mm. and falling between 6th and 7th; 1st 4 mm. longer than its coverts; 3rd, 4th and 5th emarginated.

There was a considerable drop in length between the 5th and 7th primaries with a more uniform gradation from the 7th to 10th, so that the wing had a slightly concave trailing edge with the 3rd to 6th primaries extending well beyond the line of the tips of the inner primaries or secondaries. The rounded contour of the tips of the

primary coverts (innermost shorter than next) was noticeable and agreed well with the figure in *The Handbook* (plate 38) and with the photograph of the Skokholm bird of 1951 (*Brit. Birds*, 46: plate 27b).

The bird fed quite readily on mealworms and there seemed no difficulty about keeping it in captivity overnight. It was therefore decided to take it to the British Museum (Natural History) by the first train on the following morning, with the aim of confirming the identification against skins and also, if possible, of determining the race (and thus the area of origin). At the British Museum the bird was seen by a number of people. On plumage it was thought to agree with the western Mediterranean race (*H. p. opaca*), but Mr. Kenneth Williamson (*in litt.*) has since pointed out that the measurements show it to have been of the Balkan race (*H. p. elaeica*) and that it was doubtless in first-winter plumage.

After examination the bird was released in Richmond Park. It flew away vigorously and immediately started to feed in the typical manner of a *Hippolais* in the upper foliage of some birch trees. In the field it seemed very much paler, almost bleached; it looked rather uniform above and showed hardly any yellow below. It was very shy and was soon lost to view. W. R. P. Bourne and K. D. Smith

Anting by Meadow Pipits.—In the recent notes on anting (*Brit. Birds*, 53: 11-25), no mention was made of this behaviour in the Meadow Pipit (*Anthus pratensis*). It therefore seems worth placing on record that I saw birds of this species anting at Burnham-on-Sea, Somerset, on several occasions in September and October 1957 and 1959 during their autumn migration. The greatest number I saw at any one time was six. Usually the birds were in the gutters of the South Esplanade where numbers of small, blackish ants live between the curb stones. I made all my observations during my morning walk to the office and the dates were as follows:

1957	September 24th	6 birds	1959	September 25th	3 birds
	October 10th	2 birds		October 2nd	1 bird
	October 22nd	1 bird		October 8th	1 bird
1959	September 23rd	4 birds		October 13th	5 birds
	September 24th	1 bird		October 14th	4 birds

The anting movements of the pipits were extremely rapid as the insects were picked up from the ground and brushed under the wings and, occasionally, under the tail. On each occasion the anting lasted for only a brief time (estimated at under half a minute). The birds then went on foraging for food in a loose flock with other Meadow Pipits which had not been attracted to the ants.

Other species commonly present with the Meadow Pipits were Skylark (*Alauda arvensis*), Wheatear (*Oenanthe oenanthe*), Pied/White

Wagtail (*Motacilla alba*), Yellow Wagtail (*M. flava*) and Linnet (*Carduelis cannabina*). None of these was ever seen anting and the only bird which once fed briefly on ants—a swarm of them on the sea-wall—was a male Wheatear on 26th April 1960. In the autumn in this part of Somerset flying ants are hawked by several species of birds, especially Jackdaws (*Corvus monedula*) and also Starlings (*Sturnus vulgaris*), Black-headed Gulls (*Larus ridibundus*), Common Gulls (*L. canus*) and, once, a Kestrel (*Falco tinnunculus*). E. G. HOLT

Anting behaviour by Meadow Pipits.—On 5th October 1953 I spent several minutes watching six Meadow Pipits (*Anthus pratensis*) picking up objects on a bowling-green at Par Beach, Cornwall. Unfortunately, even though I was only a few yards away, I was unable to be sure what it was they were picking up. However, all the birds assumed the typical attitude associated with anting and placed the objects under the wings and under the tail-coverts. C. J. STEVENS

Anting in the Motacillidae.—The records of anting and anting-like behaviour by Meadow Pipits (*Anthus pratensis*), which appear above, are the first for this species. In fact, no other member of the Motacillidae has been seen anting in the wild although Dr. H. Poulsen lists a Tree Pipit (*A. trivialis*) among the 104 captive individuals of 56 Passerine species that anted during his experiments in the Copenhagen Zoo (*Dansk. Orn. Foren. Tidsskr.*, 50: 267-298).

The ants used by the Meadow Pipits watched in Somerset by E. G. Holt were presumably of the species *Lasius niger*. On their breeding grounds, however, these birds would be more likely to encounter the small, yellowish *Lasius flavus* whose mounds are often extremely numerous on down-land and similar habitats as, in my own experience, is the case on the Berkshire Downs where both Meadow and Tree Pipits occur. Although these ants live underground, opportunities for the pipits to ant with them would come whenever the mounds were disturbed by grazing animals or when the reproductive-swarming occurred in late summer. It would certainly be worth while watching for anting by pipits and other downland Passerines at the often conspicuous mounds of this ant and the situation lends itself to easy experimentation.

It seems appropriate to refer briefly here to an experiment I made on 17th September 1958 at Reading, Berkshire, with *dead* workers of the Wood Ant (*Formica rufa*). This was part of an extensive study of anting problems, of which a full account will appear elsewhere. Several ants were deposited, along with nest debris, on the edge of a large playing-field where twenty-one Yellow Wagtails (*Motacilla flava*) were gathered. The ants were only recently dead and still fresh, and

so retained their characteristic acid taste. Several of the wagtails came and foraged amongst the debris and were seen to eat ants, some individuals consuming several and others soon moving away. They took their time over eating each ant, picking it up, dropping it, picking it up again and banging it against the ground, and so on, before finally swallowing it. The birds frequently shook their heads and wiped their bills, especially after eating an ant, obviously finding it very strong to the taste. A Pied Wagtail (*M. alba*) walked amongst the debris but did not certainly attempt to eat any of the ants. Two or three House Sparrows (*Passer domesticus*) also hopped through without picking up anything. There was no sign at all of anting from any of these birds although some captive Passerines (already experienced anters) have been recorded anting with dead ants.

K. E. L. SIMMONS

Unusual roosting site of Pied Wagtails.—I can give an example of a large roost of Pied Wagtails (*Motacilla alba*) similar to that described by C. D. T. Minton (*Brit. Birds,* 53: 132-133). This one is in greenhouses used for growing carnations near Sway, Hampshire. It began about ten years ago when a pair or two nested in the foliage. Over the years numbers of nesting but mainly of roosting birds increased enormously and caused great financial loss through their droppings on the buds and blooms; in fact, the girls who picked the blooms refused to do so because they got in such a filthy mess. The owner sought the advice of the National Agricultural Advisory Service, but that body was unable to make any helpful suggestions. Finally, when one house was to be cleared in readiness for the planting of a new crop, he took the opportunity to get most of the birds into it by closing the ventilators of the other fourteen houses early. The ventilators of this one house were not opened as they normally would be each morning but remained closed, with the birds inside, from 6th to 10th February 1958. The appalling result was that 325 Pied Wagtails were picked up dead on about the 10th and 11th, and by the time the plants had been completely cleared out the owner estimated that the number dead was nearer 600. I gather that counting stopped after the first 325. The story came to light through the owner's sending two rings to the Bird-Ringing Committee with a letter explaining how he came by them. In 1959 he was not troubled at all but now (March-April 1960) numbers are beginning to build up again and, as for technical reasons too long to go into here it seems impossible to exclude the birds, it looks as though the story may be repeated, though probably on a smaller scale.

EDWIN COHEN

Recent reports and news

By I. J. Ferguson-Lees and Kenneth Williamson

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PASSAGE OF TERNS—NOTABLY BLACK AND SOME RARER SPECIES

The second and third weeks of May, and to a lesser extent the first, saw an unusually heavy passage of sea-terns (*Sterna* spp.), the now annually expected but nevertheless still very striking movement of Black Terns (*Chlidonias niger*), and the occurrence of several rarer members of this group. The sea-terns were most marked along the south coast of England, making their way eastwards up the Channel, but surprising numbers—tens and twenties or more—were reported at the same time as Black Terns from several reservoirs in the Midlands and the London area. Common or Arctic Terns (*S. hirundo* or *macrura*) were the main birds involved, with good-sized parties of Sandwich (*S. sandvicensis*) on the coast, but Roseate and Little Terns (*S. dougallii* and *albifrons*) also took part and these two species, rare inland, were even recorded at one or two reservoirs.

The main period of the Black Tern movement appears to have extended from 8th to 15th May, with stragglers up to the 21st and even to the beginning of June. Within these limits the dates of the peak varied in different parts of the country. The heaviest up-Channel passage at Dungeness (Kent) was noted on 8th May (55) and 15th May (113), but inland in the south and also in East Anglia the bulk of the movement took place on the 10th and more particularly the 11th and 12th. At Cley (Norfolk), for example, 162 were counted on the 10th, 100 on the 11th and 372 on the 12th. In the Midlands and further north, as is often the case, the peak was a day or two later—on the 12th and 13th, extending to the 14th and 15th. A total of over 100 at Leigh Flash (Lancashire) and parties of 45 and 22 at Rostherne and Tatton Meres (both Cheshire) were noteworthy gatherings for the north-west on the 13th, and on the same day there were 180 or more at Pitsford Reservoir (Northamptonshire), a splendid number for one of the most inland counties of all. On the 14th there were over 70 at Burton (Cheshire) and still 54 at Leigh Flash, while on the 15th there were 22 at Shotton Pools (Flintshire) and 11 at Leighton Moss (Lancashire). Anglesey had smaller numbers about this time, while in the Trent valley, near Nottingham, a total of 70 on the 12th was exceeded by 104 on the 13th. In contrast, there were only two at Spurn (Yorkshire) during the peak period, though as early as 1st May there had been 34 and there were 18 as late as the 31st. In general, the biggest gatherings were reported from the Channel coast and from that part of England which lies between a westwards extension of the Humber and a line from the Severn eastwards. Almost all the directional observations throughout the period referred to parties travelling between east and north-east.

We have doubtless received only a small proportion of the records of Black Terns during May, but these probably include a good percentage of the larger concentrations and so we believe that we have sufficient to make the following daily totals of birds reported useful as a guide to the size and duration of the movement:

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It is interesting to compare this picture with that which emerged from a similar brief survey that we made of the Black Tern movements in May 1959 (*Brit. Birds*, 52: 272-273 and 276-277). Then there were two distinct peaks, a small one during the 9th-11th and a much larger one during the 22nd-25th. Even so, the total number of birds this year appears to have been considerably higher. The total reported in the eight days around the main peak in 1959 was 2,500, while in a similar eight-day period in 1960 (8th-15th May) it was 4,068. Finally, it is interesting to draw attention to the fact that there is no question of a week-end bias in the picture that emerges of the 1960 passage: by far the three heaviest days were the Wednesday, Thursday and Friday. Please could we have as soon as possible any records of Black Terns during May that have not yet been reported to us?

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OTHER RARER SPECIES FROM SOUTHERN EUROPE

The same general period, the middle twenty days of May, provided the main spring influx of vagrants from the south of Europe and of Fenno-Scandian migrants off course on their way north. Apart from the terns, there was very little in the way of wide-spread movements linking up the observations, but this mid-May scattering of species in these categories seems to be an annual event. This year perhaps the most interesting list of records came from Norfolk. In that county there was a Crane (*Megalornis grus*) at Breydon Water on 4th and 8th May and an Alpine Swift (*Apus melba*) at the same place on the 12th; a female Red-footed Falcon (*Falco vespertinus*) at Cley on the 13th; a Lesser Grey Shrike (*Lanius minor*) at Salthouse Heath on the 15th and 16th; four single Woodchat Shrikes (*L. senator*), at Salthouse Heath on the 16th and 17th, at Blakeney Point from the 20th to the 22nd, and at Cley and Thornham on the 26th; a Tawny Pipit (*Anthus campestris*) at Salthouse marshes from the 15th to the 18th; an Icterine Warbler (*Hippolais icterina*) singing at Scolt Head on the 20th; and a first-summer male Subalpine Warbler (*Sylvia cantillans*) at Blakeney Point on the 22nd and 23rd. The last two were caught and ringed.

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and on the 24th, at Fair Isle on the 12th, at Addington (Surrey) on the 13th, and at Gibraltar Point (Lincolnshire) on 10th June. On the same day as the Woodchat at Fair Isle an Isabelline Shrike (*L. cristatus isabellinus*[*phoenicuroides*) was trapped there. The first British record of one of these red-tailed shrikes (very different in appearance from the red-backed shrikes but now generally regarded as conspecific with them) was in 1950 at the Isle of May (*Brit. Birds*, 44: 217-219). As though this were not enough, a Lesser Grey Shrike was also a visitor to Fair Isle on 5th June. Some weeks after the Alpine Swift in Norfolk, single birds of this species were seen at Gruinard Bay (Ross-shire) and Eccup Reservoir (Yorkshire) on 3rd and 4th June respectively.

Little Egrets (*Egretta garzetta*) are now also annually reported in May and this year single birds were seen by the River Clyst at Topsham (Devon) on the 20th and at Titchfield Haven (Hampshire) on the 29th. Other birds of the heron group included two White Storks (*Ciconia ciconia*), the first at Grove Ferry (Kent) on 26th May and the second at Cosham (Hampshire) on the 28th; two Little Bitterns (*Ixobrychus minutus*) stayed at Titchfield Haven (Hampshire) from 21st May; and Spoonbills (*Platalea leucorodia*) in ones and twos were reported from almost every east coast county from Kent to Lincolnshire and Yorkshire during May and June.

The most noteworthy Passerine species was Kent's second Red-rumped Swallow (*Hirundo daurica*) in a period of nine months: this bird has been recorded in Britain only eight times, but one was well seen at Yalding on 21st May. No less than three Great Reed Warblers (*Acrocephalus arundinaceus*) were reported from south coast counties, at Selsey Bill (Sussex) on 16th May, at Titchfield Haven (Hampshire) from the 18th to at least the 22nd, and at Par Beach (Cornwall) from 29th May to 2nd June. Melodious Warblers (*Hippolais polyglotta*) are chiefly recorded in the autumn, but this year two single ones were trapped at Skokholm (Pembrokeshire) on 23rd May and 3rd June. A Greenish Warbler (*Phylloscopus trochiloides*) was trapped and ringed at Spurn (Yorkshire) on 4th June and still present next day. Following the exceptional numbers of westward wanderers last autumn (*Brit. Birds*, 53: 46-47), it is no less interesting to note the presence of Red-breasted Flycatchers (*Muscicapa parva*) at Spurn and Flamborough (Yorkshire) on 15th and 21st May respectively; and, more remarkable still, a first-summer female at the Calf of Man on 21st June—only the second Manx record. A Red-throated Pipit (*Anthus cervinus*) was identified at Pagham Harbour (Sussex) on 10th May and there was a Tawny Pipit at Spurn on the 2nd, while Fair Isle had a Little Bunting (*Emberiza pusilla*) and a Short-toed Lark (*Calandrella cinerea*) on the 13th and 14th respectively.

Fair Isle also had her usual flush of Bluethroats (*Cyanosylvia svecica*) between 12th and 16th May, with as many as five on the 14th, and a laggard on the 22nd; in addition, there were single ones on the Inner Farne (Northumberland) and at Flamborough (Yorkshire) on the 21st and 22nd respectively. Another species of less regular occurrence in spring than in autumn is the Ortolan Bunting (*Emberiza hortulana*) and so we should mention one at Portland (Dorset) on 5th May, single birds at Fair Isle on the 12th and 21st, and a male at Great Saltee (Co. Wexford) on the 14th joined by a female on the 15th. At Great Saltee, too, a Grey-headed Wagtail (*Motacilla flava thunbergi*) and a Blue-headed Wagtail (*M. f. flava*) were trapped on 2nd May, while Fair Isle had a similar assortment—four Grey-headed and one Blue-headed—on the 11th-12th. Reports of Golden Orioles (*Oriolus oriolus*) were confined to East Anglia and the south-east except for one at Skomer (Pembrokeshire)on 28th May, two at St. Agnes (Isles of Scilly) in the first week of June and more on two other islands of the Scilly group about the same time; also one at Studland Heath (Dorset) on 4th June. Skokholm (Pembrokeshire) turned up a fairly late Firecrest (*Regulus ignicapillus*) on the 26th and 27th.

Hoopoes (*Upupa epops*) were seen in May in most south coast counties and in southern Ireland. Kent, for example, reported a total of six. There were also

several in Norfolk, odd ones in other parts of East Anglia and a scattering from Surrey across to Somerset, Monmouthshire and Merioneth. More unusual were one at Thornton-le-Dale and Levisham (Yorkshire) in late April, one at Tory Island (Co. Donegal) on 1st May, one at Breadsall (Derbyshire) from 2nd to 5th May, one at Redesdale (Northumberland) on 8th May, one at Spurn (Yorkshire) on 13th May and one at Grosmont near Whitby (Yorkshire) the next day, one at Speke (Lancashire) on 17th May and one at Woodthorpe (Nottingham) on 16th June. In Jersey (Channel Islands), on the other hand, it was considered a very poor year for this species.

AMERICAN AND ASIATIC SPECIES AND POSSIBLE ESCAPES

A few American and Asiatic birds were also reported during the spring. These include one or two earlier observations which have not previously received notice in these pages. First we should mention a male Ring-necked Duck (*Aythya collaris*) which stayed at Lurgan (Co. Armagh) from 20th March until at least the beginning of May. Two records of this species in England have been accepted in recent years (*Brit. Birds*, 48: 377-378; 52: 427-430) and it is generally considered that the possibility of escapes being involved is very remote. At the beginning of April two rare waders were identified on Bardsey Island (Caernarvonshire). The first was an American or Asiatic Golden Plover (*Charadrius dominicus*) on 6th April and the second a Grey-rumped Sandpiper (*Tringa incana*) on 8th and 9th April. More recently another American wader, a Spotted Sandpiper (*Tringa hypoleucos macularia*), was seen further south in Wales: this bird stayed by the River Taf at Whitland (Carmarthenshire) from 15th to 18th May.

On 26th May a Slate-coloured Junco (*Junco hyemalis*) was trapped at Dungeness (Kent). The only previous record of this American species in Britain and Ireland—on almost the same date 55 years ago (*Brit. Birds*, 48: 14)—has always been assumed to refer to a bird that had escaped from captivity, but the facts of the present case remain to be fully considered. Two Red-headed Buntings (*Emberiza bruniceps*) were reported, a male at Dungeness (Kent) on 15th May and another at Cley (Norfolk) on 4th June. In view of the strong likelihood that most Red-headed Buntings at large in Britain and Ireland are escapes from captivity (*Brit. Birds*, 43: 172), it should be added that from the excellent state of its plumage and the brightness of its head coloration the Cley bird was either wild or had been at large for a considerable period. Finally, it was generally considered that a Rose-coloured Starling (*Sturnus roseus*) which stayed at Lowestoft (Suffolk) from 13th to 18th May was not a wild bird: this conclusion was based on its tameness and curious feeding habits and on the dullness and wear of its plumage.

GULLS, WADERS, WATERFOWL, BIRDS OF PREY, LATE WINTER VISITORS

Among the many records of Little Gulls (*Larus minutus*) were a number from inland localities: one in Middlesex on 30th April and three in the same general area for at least the first three weeks of May; two in Northamptonshire from 13th to at least 15th May; three or four in Nottinghamshire between 8th and 12th May and one earlier (25th April). Iceland Gulls (*L. glaucoides*) were reported between mid-April and mid-May from St. Kilda, Co. Down, Flintshire, Dorset, Hampshire, Sussex, Norfolk, Yorkshire and Co. Durham. The only Mediterranean Black-headed Gull (*L. melanocephalus*) we have heard of during May was an immature with a black head at Selsey Bill (Sussex) on the 11th.

A feature of the wader passage during April, May and early June was the good numbers of Curlew Sandpipers (*Calidris testacea*) and to a lesser extent of Little Stints (*C. minuta*), Spotted Redshanks (*Tringa erythropus*) and Wood Sandpipers (*T. glareola*). The largest group of Curlew Sandpipers reported was 20 at Titchfield Haven (Hampshire) on 26th April, but records of smaller parties came from many

places and Ireland had one of its very few spring records when one was seen at Lough Neagh (Co. Armagh) on 8th May. A female Red-necked Phalarope (*Phalaropus lobatus*) in summer plumage was observed at Altrincham (Cheshire) on 28th May. The only Temminck's Stints (*Calidris temminckii*) reported were single birds at Farlington Marshes (Hampshire) on 1st and 29th May. Among May records of Kentish Plover (*Charadrius alexandrinus*) were one at Cley (Norfolk) on 1st May and one on the Exe Estuary (Devon) on the 22nd. Five Dotterel (*Ch. morinellus*) at Skokholm (Pembrokeshire) on 7th May provided the first record for the island. Avocets (*Recurvirostra avosetta*) were recorded on various parts of the east and south coasts and some were seen inland in Nottinghamshire: five at Gunthorpe on 13th May and one there and at Netherfield on the 17th (*cf. Brit. Birds*, 53: 239). Inland occurrences of Turnstones (*Arenaria interpres*) included a maximum of seven in Nottinghamshire in mid-May and 12 at Harpenden (Hertfordshire) on 11th May.

There was a female Red-crested Pochard (*Netta rufina*) at Langtoft gravel pits (Lincolnshire) on 15th May. Four immature Bewick's Swans (*Cygnus columbianus bewickii*) remained late at Alvecote Pools (Warwickshire), staying until 1st May, on which day there was also a late Whooper Swan (*C. cygnus*) at Malltraeth (Anglesey).

Three or four Kittiwakes (*Rissa tridactyla*) were reported far inland in April and more remarkable was one at Netherfield (Nottinghamshire) on 22nd May. On this date there were still two immature Shags (*Phalacrocorax aristotelis*) at King George VI Reservoir (Middlesex) and as late as 26th June at least eight young Shags remained at Seaford Head (Sussex) (*cf. Brit. Birds*, 53: 280).

Several Ospreys (*Pandion haliaëtus*) were reported in April and May in various parts of the country and as late as 3rd June one was seen in Perthshire well away from Loch Garten (Inverness-shire) where a pair is again breeding this year. Among records of Marsh Harriers (*Circus aeruginosus*) away from the normal areas was one at Llyn Dinam (Anglesey) on 14th May.

Late winter visitors included Lapland Buntings (*Calcarius lapponicus*) at Spurn (Yorkshire) on the 7th, 14th and 22nd. Similarly, there was a pair of Snow Buntings (*Plectrophenax nivalis*) at Thornham (Norfolk) on 25th May (the last of a small passage at Fair Isle was seen on the 4th). The last Waxwing (*Bombycilla garrulus*) to be reported was a freshly dead bird at Fair Isle on 22nd April.

SUMMER VISITOR ARRIVALS

Several additions should be made to the list of early summer visitors reported last month. One of the most remarkable was a Nightingale (*Luscinia megarhynchos*) which was seen and heard at Browndown (Hampshire) on 31st March and the days that followed. Hardly less interesting, however, was the Sedge Warbler (*Acrocephalus schoenobaenus*) in song at the same locality on 25th March and subsequently. This is much earlier than the several Sedge Warblers in the second week of April referred to last month (p. 280), to which should be added single ones in Middlesex and Cornwall on 7th and 10th respectively.

We mentioned the early arrivals of Swifts (*Apus apus*) last month (p. 279) and have received a number of other records as a result. The main influx began, as we have already shown, on 24th April, but we have now heard of single birds at Lee-on-the-Solent and Browndown (Hampshire) on 9th and 18th April, followed by two at Fareham (Hampshire) and one at Barn Elms (Surrey) on the 23rd; we have already referred to three at Portland (Dorset) on this last date. By the 26th Swifts had reached Lancashire and Westmorland, by the 27th they were in Co. Durham and on the 28th they were reported as far north as Strathtay in Perthshire—the earliest there since 1946. In several parts of the country it was noted that the first arrivals were chiefly concentrated over gravel-pits and reservoirs and not over the breeding areas in the towns.

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